

DECLARATION of CONFORMITY

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Commercial Audio Power Amplifiers
Xs
Xs4300, Xs1200, Xs900, Xs700, Xs500

Electromagnetic Compatibility - Product Family Standard for Audio, Video, Audio-Visual and Entertainment Lighting Control Apparatus for Professional Use, Part 1: Emissions
Magnetic Field Emissions-Annex A @ 10 cm and 1 M

Limits for Harmonic Current Emissions (equipment input current \leq 16A per phase)

Limitation of Voltage Fluctuations and Flicker in Low-Voltage Supply Systems Rated Current \leq 16A

& Limits and Methods of Measurement of Radio Disturbance Characteristics of ITE: Radiated, Class B Limits; Conducted, Class B

Electromagnetic Compatibility - Product Family Standard for Audio, Video, Audio-Visual and Entertainment Lighting Control Apparatus for Professional Use, Part 2: Immunity

Electrostatic Discharge Immunity (Environment E2-Criteria B, 4k V Contact, 8k V Air Discharge)

Radiated, Radio-Frequency, Electromagnetic Immunity (Environment E2, criteria A)

Electrical Fast Transient/Burst Immunity (Criteria B)

Surge Immunity (Criteria B)

Immunity to Conducted Disturbances Induced by Radio-Frequency Fields (Criteria A)

Voltage Dips, Short Interruptions and Voltage Variation

1998 Safety Requirements - Audio Video and Similar Electronic Apparatus

I certify that the product identified above conforms to the requirements of the EMC Council Directive 89/336/EEC as amended by 92/31/EEC, and the Low Voltage Directive 73/23/EES as amended by 93/68/EEC.

Signed



Larry Coburn
Title: Senior Vice President of Manufacturing

Date of Issue: March 1, 2003

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1 kHz
Power*

- 2-ohm Dual (per ch.)
- 4-ohm Dual (per ch.)
- 8-ohm Dual (per ch.)
- 4-ohm Bridge
- 8-ohm Bridge

*1 kHz Power: refers to maximum average power in watts at 1kHz with 0.15% THD.

** at 0.5% THD.

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- 2-ohm Dual (per ch.)
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1 Welcome

The Xs Series of power amplifiers from Crown® represents a new era in affordable, quality power amplification. The line consists of five models: four 2-channel units and one 4-channel unit, each in a uniform, rugged chassis. The Xs Series incorporates the best of tried-and-true design principles and innovative features.

Modern power amplifiers are sophisticated pieces of engineering capable of producing extremely high power levels. They must be treated with respect and correctly installed if they are to provide the many years of reliable service for which they were designed.

In addition, Xs Series amplifiers include a number of features which require some explanation before they can be used to their maximum advantage.

Please take the time to study this manual so that you can obtain the best possible service from your amplifier.

1.1 Features

- Housed in a rugged, all-steel 2U chassis.
- Efficient forced-air fans prevent excessive thermal buildup.
- 2-channel models have touch-proof binding post outputs, Speakon® outputs, Phoenix-style inputs, and electronically balanced XLR-1/4" combo inputs with daisy-chain XLR outputs. Xs4300 has XLR-1/4" combo inputs and touch-proof binding post outputs.
- Features precision detented level controls, power switch, and eight LEDs which indicate signal and clip for each channel, AC mains, power, bridge mode, temperature and fault conditions.
- Microprocessor-controlled protection system.
- Three-Year, No-Fault, Fully Transferable Warranty completely protects your investment and guarantees its specifications.

1.2 How to Use This Manual

This manual provides you with the necessary information to safely and correctly setup and operate your amplifier. It does not cover every aspect of installation, setup or operation that might occur under every condition. For additional information, please consult Crown's Amplifier Application Guide (available online at www.crownaudio.com), Crown Technical Support, your system installer or retailer.

We strongly recommend you read all instructions, warnings and cautions contained in this manual. Also, for your protection, please send in your warranty registration card today. And save your bill of sale — it's your official proof of purchase.

1 kHz
Power*

- 2-ohm Dual (per ch.)
- 4-ohm Dual (per ch.)
- 8-ohm Dual (per ch.)
- 4-ohm Bridge
- 8-ohm Bridge

*1 kHz Power: refers to maximum average power in watts at 1kHz with 0.15% THD.

** at 0.5% THD.

1 kHz
Power*

- 4-ohm Dual (per ch.)
- 8-ohm Dual (per ch.)
- 8-ohm Bridge

*1 kHz Power: refers to maximum average power in watts at 1kHz with 0.15% THD.

2 Setup

2.1 Unpack Your Amplifier

Please unpack and inspect your amplifier for any damage that may have occurred during transit. If damage is found, notify the transportation company immediately. Only you can initiate a claim for shipping damage. Crown will be happy to help as needed. Save the shipping carton as evidence of damage for the shipper's inspection.

We also recommend that you save all packing materials so you will have them if you ever need to transport the unit.

YOU WILL NEED (not supplied):

- Input wiring cables
 - Output wiring cables

Rack for mounting amplifier (or a stable surface for stacking)



Use a standard 19-inch (48.3 cm) equipment rack (EIA RS-310B). See Figure 2.1 for amplifier dimensions.

You may also stack amps without using a cabinet

NOTE: When transporting, amplifiers should be supported at both front and back.



Figure 2.1
Dimensions

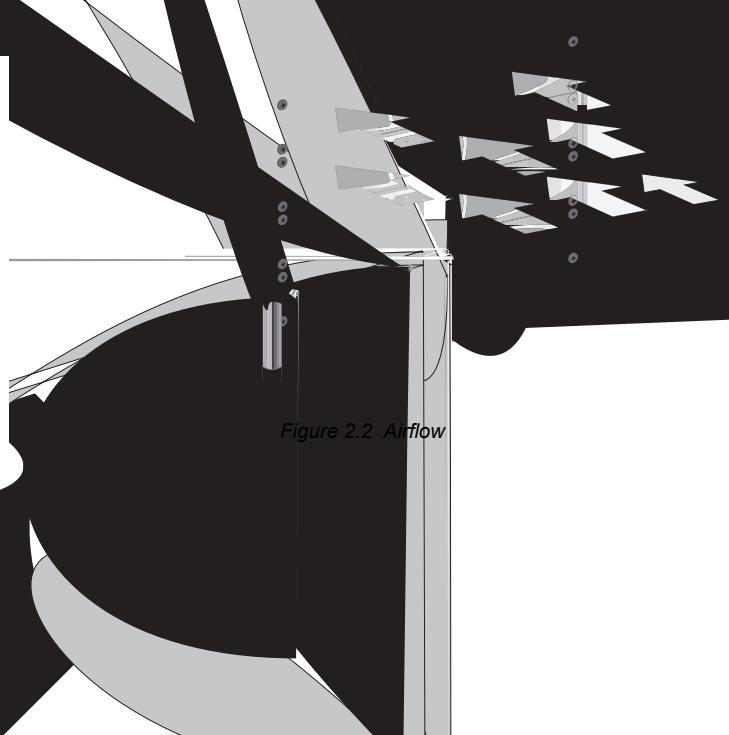


Figure 2.2 Airflow

2.4 Choose Input Wire and Connectors

Input Wire

Crown recommends using pre-built or professionally wired balanced lines (vs. unbalanced), such as speaker cables and connectors. You can also use unbalanced inputs, like external mixers.

- 3-pin male XLR
- TRS or TS 1/4" phone plug
- Phoenix-style connector (for 2-channel models)

Unbalanced lines may be used, but they may result in noise and hum in long cable runs.

Figure 2.3 shows XLR wiring, Figure 2.4 shows 1/4" phone plug wiring, and Figure 2.5 shows Phoenix-style connector wiring.

*Figure 2.3
Input Connector XLR
Balanced (Top) and
Unbalanced (Bottom)*

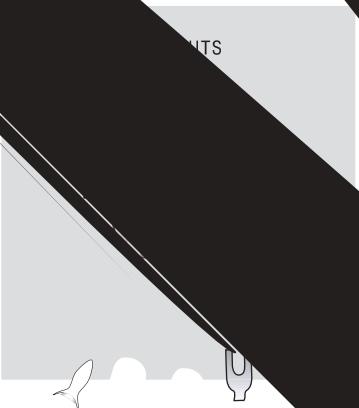
2.5 Choose Output Wire and Connectors

Crown recommends using pre-built or professionally wired high-quality, two- or four-conductor, heavy gauge speaker wire and connectors. You can use banana plugs, spade lugs, or bare wires for your output connectors (Figure 2.6). Also, in the 2-channel models, you can use a 4-pole Speakon® connector (Figure 2.7 and Table 1). To prevent the possibility of short-circuits, wrap or otherwise insulate exposed loudspeaker cable connectors.

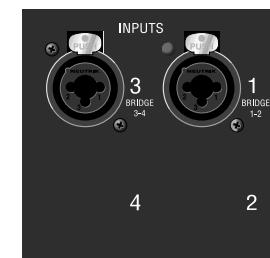
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Using the guidelines below, select the appropriate size of wire based on the distance from amplifier to speaker.

| | |
|--------------|--------|
| up to 25 ft. | 16 AWG |
| 26-40 ft. | 14 AWG |
| 41-60 ft. | 12 AWG |
| 61-100 ft. | 10 AWG |
| 101-150 ft. | 8 AWG |
| 151-250 ft. | 6 AWG |



*Figure 2.6
Binding Post Output Wiring for 2-Channel Models*



2 Setup

NOTE: In Bridge-Mono mode, only the Channel 1 Level control is functional.

2.7 Connect to AC Mains

Connect your amplifier to the AC mains power source (power outlet) with the supplied AC power cordset. First, connect the IEC end of the cordset to the IEC connector on the amplifier; then, plug the other end of the cordset to the AC mains. The AC Mains indication light on the front panel should be lit.



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Amplifiers don't create energy. The AC mains voltage and current must be sufficient to deliver the power you expect. You must operate your amplifier from an AC mains power source with not more than a 10% variation above or a 15% variation below the amplifier's specified line voltage and within the specified frequency requirements (indicated on the amplifier's back panel label). If you are unsure of the output voltage of your AC mains, please consult your electrician.

2.8 Protecting Your Speakers

It's wise to avoid clipping the amplifier signal. Not only does clipping sound bad, it can damage high-frequency drivers. To prevent clipping, insert a limiter between your mixer output and amplifier input. That way, no matter how strong a signal your mixer produces, the amplifier will not clip. Set the limiter threshold so that mixer signals above 0 on the mixer meters do not quite drive the amplifier into clipping.

Also, avoid sending strong subsonic signals to the amplifier. High-level, low-frequency signals from breath pops or dropped microphones can blow out drivers. To prevent subsonic signals, insert a high-pass filter between mixer output and amplifier input (or between mixer and limiter). Alternatively, switch in highpass filters at your mixer. Set the filter to as high a frequency as possible that does not affect your program. For example, try 35 Hz for music and

75 Hz for speech. On each mixer input channel, set the filter frequency just below the lowest fundamental frequency of that channel's instrument.

2.9 Startup Procedure

Use the following procedure when first turning on your amplifier:

1. Turn down the level of your audio source.
2. Turn down the level controls of the amplifier.
3. Turn on the "Power" switch. The Power indicator should glow.
4. Turn up the level of your audio source to an optimum level.
5. Turn up the Level controls on the amplifier until the desired loudness or power level is achieved. NOTE: In Bridge-Mono mode, only the Channel 1 Level control is functional.
6. Turn down the level of your audio source to its normal range.



If you ever need to make any wiring or installation changes, don't forget to disconnect the power cord.

For help with determining your system's optimum gain structure (signal levels) please refer to the Crown Amplifier Application Guide, available online at www.crownaudio.com.

3 Operation

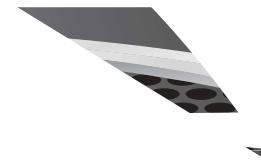
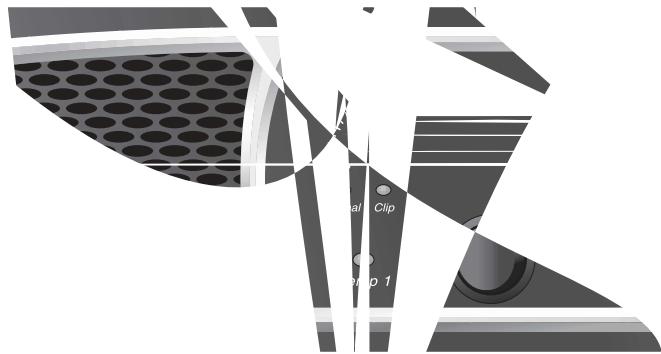
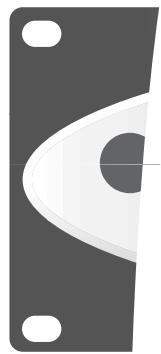
3.1 Precautions

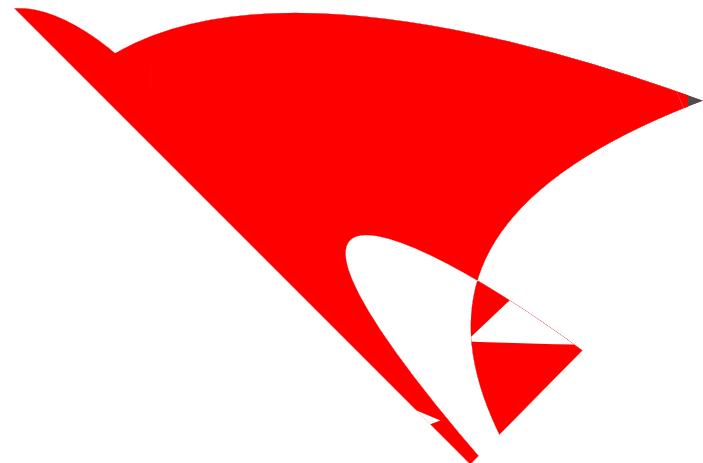
Your amplifier is protected from internal and external faults, but you should still take the following precautions for optimum performance and safety:

1. Before use, your amplifier first must be configured for proper operation, including input and output wiring hookup. Improper wiring can result in serious operating difficulties. For information on wiring and configuration, please consult the Setup section of this manual or, for advanced setup techniques, consult Crown's Amplifier Application Guide available online at www.crownaudio.com.
2. Use care when making connections, selecting signal sources and controlling the output level. The load you save may be your own!
3. Do not short the ground lead of an output cable to the input signal ground. This may form a ground loop and cause oscillations.
5. Tampering with the circuitry, or making unauthorized circuit changes may be hazardous and invalidates all agency listings.
6. Do not operate the amplifier with the red Clip LEDs constantly flashing.
7. Do not overdrive the mixer, which will cause clipped signal to be sent to the amplifier. Such signals will be reproduced with extreme accuracy, and loudspeaker damage may result.
8. Do not operate the amplifier with less than the rated load impedance. Due to the amplifier's output protection, such a configuration may result in premature clipping and speaker damage.



Remember: Crown is not liable for damage that results from overdriving other system components.





3 Operation

3.4 Back Panel Controls and Connectors (Xs4300)

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Two-position switch selects between normal (stereo) operation and Bridge-Mono operation.

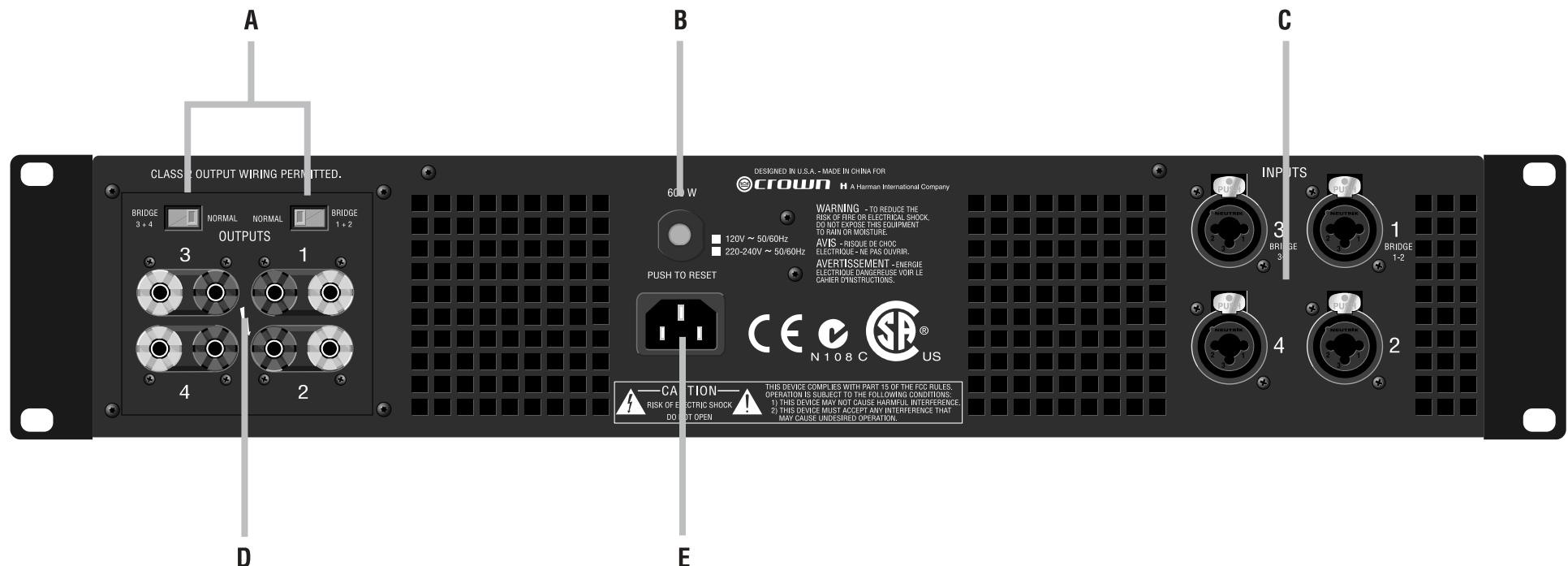
Provides overload protection.

"

One per channel, XLR-1/4" combo connector includes 3-pin female XLR connector and TRS 1/4" phone jack. Accepts balanced or unbalanced signals.

One pair per channel; accept banana plugs, spade lugs or bare wire.

Note: Binding post outputs on European models come with safety plugs installed to prevent European power-cord plugs from being inserted. The top & bottom entry positions for these connectors should therefore be used with European models.



4 Advanced Features and Options

Amplifier Application Guide

Guide

4.1 Protection Systems

Your Crown amplifier provides extensive protection and diagnostic capabilities, including output current limiting, microprocessor-controlled DC protection, circuit breaker, and special thermal protection for the unit's transformers.

4.1.1 Output Current Limiting

Output Current Limiting circuitry protects the amplifier output stage from damage caused by short-circuit loads.

4.1.2 DC Protection

DC Protection disconnects the loudspeaker load in the event of an output DC offset exceeding 2V. In such an event the yellow Fault LED will illuminate (see Figure 4.1) and the amplifier channel will be muted. In the majority of cases, DC protection is indicative of a faulty amplifier channel, and will be accompanied by an illuminated Clip LED, even with no input connected and level controls set at minimum. If this is the case, contact your dealer or service center.



Figure 4.1
Fault Indicator

4.1.3 Circuit Breaker

The high-voltage power supplies of your Crown amplifier are protected by a circuit breaker. The breaker rating varies depending on model and supply voltage as follows:

Table 2: Circuit-Breaker Amperage Ratings

| | 120V | 220V | 240V |
|--------|------|------|------|
| Xs4300 | 18A | 12A | 12A |
| Xs1200 | 20A | 15A | 15A |
| Xs900 | 18A | 12A | 12A |
| Xs700 | 18A | 12A | 12A |
| Xs500 | 18A | 12A | 12A |

4.1.4 Thermal Protection

The Thermal Protection circuit will activate if the internal heatsink temperature exceeds proper operating temperatures (194 °F, 90 °C). When the heatsink temperature has fallen to a safe level, this protection circuit will automatically be reset. Principle causes of thermal protection are:

- 1) Inadequate ventilation of the equipment rack
- 2) Incorrect load impedance
- 3) Output cable short circuit
- 4) Blocked air vent
- 5) Heatsinks in need of cleaning
- 6) Cooling fan failure.

The cause of your amplifier's thermal protection state should be determined and corrected as soon as possible. Without correction, the Thermal Protection circuit will typically reactivate.

5 Troubleshooting



POSSIBLE REASON:

- This is normal operation for your amp.



POSSIBLE REASONS:

- The amplifier's Power switch is off.
- The amplifier's power cord is unplugged.
- The amplifier's high-voltage power supply circuit breaker has tripped. Verify that the AC mains voltage is correct, then press the Circuit Breaker button on the back panel.



POSSIBLE REASON:

- Input signal level is too high. Turn down your amplifier Level controls. NOTE: Your amplifier should never be operated at a level which causes the Clip LEDs to illuminate constantly.



POSSIBLE REASONS:

- The amplifier has just turned on and is still in the 4-second turn-on delay.
- The amplifier is in "fault" mode. A Fault status can be triggered when one of the amplifier's protection circuits is activated. First disconnect your speakers from the affected channel(s) one by one to determine if one of the loads is shorted. If the indicators return to normal status, then try a different speaker or cable to determine where the short is occurring. If no short can be found, turn off the amp and allow the amp to cool. If indicators do not return to normal after restarting your amp, check the fuse and replace if necessary, or return amp to Crown or an authorized Crown Service Center for servicing.
- Channel is in thermal protection.



- No input signal
- Input signal level is very low.
- Level controls are turned down.



- Speakers not connected.

6 Specifications

| Minimum Guaranteed Power | Xs500 | Xs700 | Xs900 | Xs1200 | Xs4300 |
|--|---------------------|---------------------|----------------------|---------------------|----------------------|
| % | | | | | |
| Dual, 2 ohms (per ch.) | 750W* | 900W* | 1200W* | 1600W* | Not rated |
| Dual, 4 ohms (per ch.) | 500W | 750W | 900W | 1100W | 300W |
| Dual, 8 ohms (per ch.) | 400W | 450W | 600W | 650W | 200W |
| Bridge mono, 4 ohms | 1600W* | 1900W* | 2500W* | 3000W* | Not rated |
| Bridge mono, 8 ohms | 1450W | 1645W | 2100W | 2300W | 700W |
| Performance | Xs500 | Xs700 | Xs900 | Xs1200 | Xs4300 |
| Sensitivity (volts RMS) for full rated power at 4 ohms | 1.4V | 1.4V | 1.4V | 1.4V | 1.4V |
| Frequency Response (at 1 watt, 22Hz - 22 kHz) | ± 1 dB | ± 1 dB | ± 1 dB | ± 1 dB | ± 1 dB |
| Phase Response (at 1 watt, 20Hz to 20 kHz) | +5°, -18° | +5°, -18° | +5°, -18° | +5°, -18° | +5°, -18° |
| Signal to Noise Ratio below rated power (typical) A-weighted 22 Hz to 22 kHz filter | > 102 dB > 97 dB | > 103 dB > 98 dB | > 108 dB > 106 dB | > 109 dB > 107dB | > 107 dB > 101 dB |
| Total Harmonic Distortion (THD) at 1 full bandwidth power, from 20 Hz to 20 kHz | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% |
| Intermodulation Distortion (IMD) 60 Hz and 7 kHz at 4:1, from full rated output to -30 dB from full rated output to -40 dB | < 0.5% < 1.0% | < 0.5% < 1.0% | < 0.5% < 1.0% | < 0.5% < 1.0% | < 0.5% < 1.0% |

* at 0.5% THD.

| PIN | CH | | PIN | CH |
|-----|------|--|-----|------|
| 1+ | 2 | | 1+ | 1 |
| 1- | 2 | | 1- | 1 |
| 2+ | NC | | 2+ | 2 |
| 2- | NC | | 2- | 2 |
| | CH 2 | | | CH 1 |

6 Specifications

| Performance | Xs500 | Xs700 | Xs900 | Xs1200 | Xs4300 |
|--|---|---|---|---|---|
| Damping Factor (8 ohm): 10 Hz to 400 Hz | > 200 | > 200 | > 200 | > 200 | > 200 |
| Crosstalk (below rated power) at 1 kHz at 20 kHz | > 55 dB > 55 dB | > 55 dB > 55 dB | > 67 dB > 62 dB | > 65 dB > 45 dB | > 57 dB > 40 dB |
| DC Output Offset (Shorted input) | ± 75 mV |
| Input Impedance (nominally balanced, nominally unbalanced) | 20 kilohms, 10 kilohms |
| Load Impedance (Note: Safe with all types of loads) Stereo Bridge Mono | 2-8 ohms 4-8 ohms | 2-8 ohms 4-8 ohms | 2-8 ohms 4-8 ohms | 2-8 ohms 4-8 ohms | 4-8 ohms 8 ohms |
| Voltage Gain (at maximum level setting) | 32:1 (30.1 dB) | 38:1 (31.6 dB) | 42:1 (32.5 dB) | 47.4:1 (33.5 dB) | 25:1 (27.8 dB) |
| AC Line Voltage and Frequency Configurations Available (± 10%) | 120 VAC/60 Hz and 240 VAC/50 Hz |
| Construction | Xs500 | Xs700 | Xs900 | Xs1200 | Xs4300 |
| Ventilation | Flow-through ventilation from front to back |
| Cooling | Internal heat sinks with forced-air cooling | Internal heat sinks with forced-air cooling | Internal heat sinks with forced-air cooling | Internal heat sinks with forced-air cooling | Internal heat sinks with forced-air cooling |
| Dimensions: Width, Height, Depth (behind mounting surface) | EIA Standard 19" W (EIA RS-310-B) x 3.5" (8.9 cm) H x 17.14" (43.5 cm) D | EIA Standard 19" W (EIA RS-310-B) x 3.5" (8.9 cm) H x 17.14" (43.5 cm) D | EIA Standard 19" W (EIA RS-310-B) x 3.5" (8.9 cm) H x 17.14" (43.5 cm) D | EIA Standard 19" W (EIA RS-310-B) x 3.5" (8.9 cm) H x 17.14" (43.5 cm) D | EIA Standard 19" W (EIA RS-310-B) x 3.5" (8.9 cm) H x 17.14" (43.8 cm) D |
| Net Weight, Shipping Weight | 28 lb 14 oz (13.1 kg), 34 lb (15.4 kg) | 28 lb 14 oz (13.1 kg), 34 lb (15.4 kg) | 28 lb 14 oz (13.1 kg), 34 lb (15.4 kg) | 28 lb 14 oz (13.1 kg), 34 lb (15.4 kg) | 28 lb 14 oz (13.1 kg), 34 lb (15.4 kg) |

7 AC Power Draw and Thermal Dissipation

This section provides detailed information about the amount of power and current drawn from the AC mains by Xs Series amplifiers and the amount of heat produced under various conditions. The calculations presented here are intended to provide a realistic and reliable depiction of the amplifiers. The following assumptions or approximations were made:

- The amplifier's available channels are loaded, and full power is being delivered.
- Efficiency at standard 1 kHz power into 4 ohms is 61% for the Xs500, 61.3% for the Xs700, 54.0% for the Xs900 and 54.0% for the Xs1200.
- Quiescent power draw is 36 watts for the Xs500, 36 watts for the Xs700, 37.4 watts for the Xs900 and 37.4 watts for the Xs1200 (an almost negligible amount for full-power calculations).
- The estimated duty cycles take into account the typical crest factor for each type of source material.
- Duty cycle of pink noise is 50%.
- Duty cycle of highly compressed rock 'n' roll midrange is 40%.
- Duty cycle of rock 'n' roll is 30%.
- Duty cycle of background music is 20%.
- Duty cycle of continuous speech is 10%.
- Duty cycle of infrequent, short duration paging is 1%.

Here are the equations used to calculate the data presented in Figures 7.1, 7.2, 7.3, 7.4 and 7.5.

$$\text{AC Mains Power Draw (watts)} = \frac{\text{Total output power with all channels driven (watts)} \times \text{Duty Cycle}}{\text{Amplifier Efficiency (.65)}} + \text{Quiescent Power Draw (watts)}$$

The quiescent power draw is a maximum value and includes power drawn by the fan. The following equation converts power draw in watts to current draw in amperes:

$$\text{Current Draw (amperes)} = \frac{\text{AC Mains Power Draw (watts)}}{\frac{\text{AC Mains Voltage}}{\text{Power Factor (.83)}}}$$

The value used for Power Factor is 0.83. The Power Factor variable is needed to compensate for the difference in phase between the AC mains voltage and current. The following equation is used to calculate thermal dissipation:

$$\text{Thermal Dissipation (btu/hr)} = \left(\frac{\text{Total output power with all channels driven (watts)} \times \text{Duty Cycle} \times .35}{\text{Amplifier Efficiency (.65)}} + \text{Quiescent Power Draw (watts)} \right) \times 3.415$$

The value used for inefficiency is 1.00-efficiency. The factor 3.415 converts watts to btu/hr. Thermal dissipation in btu is divided by the constant 3.968 to get kcal. If you plan to measure output power under real-world conditions, the following equation may also be helpful:

$$\text{Thermal Dissipation (btu/hr)} = \left(\frac{\text{Total measured output power from all channels (watts)} \times .35}{\text{Amplifier Efficiency (.65)}} + \text{Quiescent Power Draw (watts)} \right) \times 3.415$$

7 AC Power Draw and Thermal Dissipation

Figure 7.1 Xs500 Power Draw, Current Draw and Thermal Dissipation at Various Duty Cycles

| | 120V | 230V | btu/hr | kcal/hr | | 120V | 230V | btu/hr | kcal/hr | | 120V | 23 |
|--|------|------|--------|---------|--|------|------|--------|---------|--|------|----|
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |

Figure 7.2 Xs700 Power Draw, Current Draw and Thermal Dissipation at Various Duty Cycles

| Duty Cycle | LOAD | | | | | | | | | | | | | | |
|------------|-----------------------------|---------------------|------|---------------------|-----------------------------|-----------------------------|---------------------|------|------------------------------|---------|-----------------------------|---------------------|------|---------------------|---------|
| | 2 Ohm Stereo / 4 Ohm Bridge | | | | 4 Ohm Stereo / 8 Ohm Bridge | | | | 8 Ohm Stereo / 16 Ohm Bridge | | | | | | |
| | AC Mains Power Draw (watts) | Current Draw (Amps) | | Thermal Dissipation | | AC Mains Power Draw (watts) | Current Draw (Amps) | | Thermal Dissipation | | AC Mains Power Draw (watts) | Current Draw (Amps) | | Thermal Dissipation | |
| | | 120V | 230V | btu/hr | kcal/hr | | 120V | 230V | btu/hr | kcal/hr | | 120V | 230V | btu/hr | kcal/hr |
| 50% | 1504 | 15.1 | 7.9 | 2063 | 520 | 1259 | 12.6 | 6.6 | 1740 | 438 | 770 | 7.7 | 4.0 | 1093 | 275 |
| 40% | 1211 | 12.2 | 6.3 | 1675 | 422 | 1015 | 10.2 | 5.3 | 1417 | 357 | 623 | 6.3 | 3.3 | 899 | 227 |
| 30% | 917 | 9.2 | 4.8 | 1287 | 324 | 770 | 7.7 | 4.0 | 1093 | 275 | 476 | 4.8 | 2.5 | 705 | 178 |
| 20% | 623 | 6.3 | 3.3 | 899 | 227 | 525 | 5.3 | 2.8 | 770 | 194 | 330 | 3.3 | 1.7 | 511 | 129 |
| 10% | 330 | 3.3 | 1.7 | 511 | 129 | 281 | 2.8 | 1.5 | 446 | 112 | 183 | 1.8 | 1.0 | 317 | 80 |

Figure 7.3 Xs900 Power Draw, Current Draw and Thermal Dissipation at Various Duty Cycles

| Duty Cycle | LOAD | | | | | | | | | | | | | | |
|------------|-----------------------------|---------------------|------|---------------------|-----------------------------|-----------------------------|---------------------|------|------------------------------|---------|-----------------------------|---------------------|------|---------------------|---------|
| | 2 Ohm Stereo / 4 Ohm Bridge | | | | 4 Ohm Stereo / 8 Ohm Bridge | | | | 8 Ohm Stereo / 16 Ohm Bridge | | | | | | |
| | AC Mains Power Draw (watts) | Current Draw (Amps) | | Thermal Dissipation | | AC Mains Power Draw (watts) | Current Draw (Amps) | | Thermal Dissipation | | AC Mains Power Draw (watts) | Current Draw (Amps) | | Thermal Dissipation | |
| | | 120V | 230V | btu/hr | kcal/hr | | 120V | 230V | btu/hr | kcal/hr | | 120V | 230V | btu/hr | kcal/hr |
| 50% | 2260 | 22.7 | 11.8 | 3619 | 912 | 1704 | 17.1 | 8.9 | 2746 | 692 | 1149 | 11.5 | 6.0 | 1873 | 472 |
| 40% | 1815 | 18.2 | 9.5 | 2920 | 736 | 1371 | 13.8 | 7.2 | 2222 | 560 | 926 | 9.3 | 4.9 | 1524 | 384 |
| 30% | 1371 | 13.8 | 7.2 | 2222 | 560 | 1037 | 10.4 | 5.4 | 1699 | 428 | 704 | 7.1 | 3.7 | 1175 | 296 |
| 20% | 926 | 9.3 | 4.9 | 1524 | 384 | 704 | 7.1 | 3.7 | 1175 | 296 | 482 | 4.8 | 2.5 | 826 | 208 |
| 10% | 482 | 4.8 | 2.5 | 826 | 208 | 371 | 3.7 | 1.9 | 651 | 164 | 260 | 2.6 | 1.4 | 477 | 120 |



8 Service

Crown amplifiers are quality units that rarely require servicing. Before returning your unit for servicing, please contact Crown Technical Support to verify the need for servicing.

This unit has very sophisticated circuitry which should only be serviced by a fully trained technician. This is one reason why each unit bears the following label:



8.1 Worldwide Service

Service may be obtained from an authorized service center. (Contact your local Crown/Amcron representative or our office for a list of authorized service centers.) To obtain service, simply present the bill of sale as proof of purchase along with the defective unit to an authorized service center. They will handle the necessary paperwork and repair.

Remember to transport your unit in the original factory pack.

8.2 US and Canada Service

Service may be obtained in one of two ways: from an authorized service center or from the factory. You may choose either. It is important that you have your copy of the bill of sale as your proof of purchase.

8.2.1 Service at a US or Canada Service Center

This method usually saves the most time and effort. Simply present your bill of sale along with the defective unit to an authorized service center to obtain service. They will handle the necessary paperwork and repair. Remember to transport the unit in the original factory pack. A

list of authorized service centers in your area can be obtained from the Crown website at www.crownaudio.com, or by calling Crown Customer Service.

8.2.2 Factory Service

To obtain factory service, fill out the service information page found in the back of this manual and send it along with your proof of purchase and the defective unit to the Crown factory.

For warranty service, we will pay for ground shipping both ways in the United States. Contact Crown Customer Service to obtain pre-paid shipping labels prior to sending the unit. Or, if you prefer, you may prepay the cost of shipping, and Crown will reimburse you. Send copies of the shipping receipts to Crown to receive reimbursement.

Your repaired unit will be returned via UPS ground. Please contact us if other arrangements are required.

8.2.3 Factory Service Shipping Instructions:

1. Before sending a Crown product to the factory for service, first call the Crown Service Department for a return authorization (RA) number.
2. Be sure to fill out the service information form that follows and enclose it with your shipment, either inside the box or in a packing slip envelope securely attached to the outside of the shipping carton. Do not send the service information form separately. If you are sending the unit from a Shipping Center, we recommend taping the form to the product. We also recommend recording the serial number and model before shipping for your reference.

3. To ensure the safe transportation of your unit to the factory, ship it in an original factory packing container. If you don't have the original carton, you may obtain a product service foam-in-place shipping pack from the Crown Factory Service Department at the number listed below. For non-warranty service, you may also provide your own shipping pack, however we still recommend using a Crown Supplied Shipping Container. Minimum recommended requirements for materials are as follows: 275 P.S.I. burst test Double-Wall carton that allows for 2-inch solid Styrofoam on all six sides of unit or 3 inches of plastic bubble wrap on all six sides of unit; securely seal the package with an adequate carton sealing tape. Do not use light boxes or "peanuts." Damage caused by poor packing cannot be covered under warranty.
4. Do not ship the unit in any kind of cabinet (wood or metal). Ignoring this warning may result in extensive damage to the unit and the cabinet. Accessories are not needed—do not send the product documentation, cables and other hardware.

If you have any questions, please contact Crown Factory Service.

1718 W. Mishawaka Rd.,
Elkhart, Indiana 46517 U.S.A.

574-294-8200
800-342-6939 (North America,
Puerto Rico, and Virgin Islands only)

574-294-8301 (Technical Support)
574-294-8124 (Factory Service)

<http://www.crownaudio.com>

9 Warranty



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SUMMARY OF WARRANTY

Crown International, 1718 West Mishawaka Road, Elkhart, Indiana 46517-4095 U.S.A. warrants to you, the ORIGINAL PURCHASER and ANY SUBSEQUENT OWNER of each NEW Crown product, for a period of three (3) years from the date of purchase by the original purchaser (the "warranty period") that the new Crown product is free of defects in materials and workmanship. We further warrant the new Crown product regardless of the reason for failure, except as excluded in this Warranty.

ITEMS EXCLUDED FROM THIS CROWN WARRANTY

This Crown Warranty is in effect only for failure of a new Crown product which occurred within the Warranty Period. It does not cover any product which has been damaged because of any intentional misuse, accident, negligence, or loss which is covered under any of your insurance contracts. This Crown Warranty also does not extend to the new Crown product if the serial number has been defaced, altered, or removed.

WHAT THE WARRANTOR WILL DO

We will remedy any defect, regardless of the reason for failure (except as excluded), by repair, replacement, or refund. We may not elect refund unless you agree, or unless we are unable to provide replacement, and repair is not practical or cannot be timely made. If a refund is elected, then you must make the defective or malfunctioning product available to us free and clear of all liens or other encumbrances. The refund will be equal to the actual purchase price, not including inter-

est, insurance, closing costs, and other finance charges less a reasonable depreciation on the product from the date of original purchase. Warranty work can only be performed at our authorized service centers or at the factory. Warranty work for some products can only be performed at our factory. We will remedy the defect and ship the product from the service center or our factory within a reasonable time after receipt of the defective product at our authorized service center or our factory. All expenses in remedying the defect, including surface shipping costs in the United States, will be borne by us. (You must bear the expense of shipping the product between any foreign country and the port of entry in the United States including the return shipment, and all taxes, duties, and other customs fees for such foreign shipments.)

HOW TO OBTAIN WARRANTY SERVICE

You must notify us of your need for warranty service within the warranty period. All components must be shipped in a factory pack, which, if needed, may be obtained from us free of charge. Corrective action will be taken within a reasonable time of the date of receipt of the defective product by us or our authorized service center. If the repairs made by us or our authorized service center are not satisfactory, notify us or our authorized service center immediately.

DISCLAIMER OF CONSEQUENTIAL AND INCIDENTAL DAMAGES

YOU ARE NOT ENTITLED TO RECOVER FROM US ANY INCIDENTAL DAMAGES RESULTING

FROM ANY DEFECT IN THE NEW CROWN PRODUCT. THIS INCLUDES ANY DAMAGE TO ANOTHER PRODUCT OR PRODUCTS RESULTING FROM SUCH A DEFECT. SOME STATES DO NOT ALLOW THE EXCLUSION OR LIMITATIONS OF INCIDENTAL OR CONSEQUENTIAL DAMAGES, SO THE ABOVE LIMITATION OR EXCLUSION MAY NOT APPLY TO YOU.

WARRANTY ALTERATIONS

No person has the authority to enlarge, amend, or modify this Crown Warranty. This Crown Warranty is not extended by the length of time which you are deprived of the use of the new Crown product. Repairs and replacement parts provided under the terms of this Crown Warranty shall carry only the unexpired portion of this Crown Warranty.

DESIGN CHANGES

We reserve the right to change the design of any product from time to time without notice and with no obligation to make corresponding changes in products previously manufactured.

LEGAL REMEDIES OF PURCHASER

THIS CROWN WARRANTY GIVES YOU SPECIFIC LEGAL RIGHTS, YOU MAY ALSO HAVE OTHER RIGHTS WHICH VARY FROM STATE TO STATE. No action to enforce this Crown Warranty shall be commenced after expiration of the warranty period.

THIS STATEMENT OF WARRANTY SUPERSEDES ANY OTHERS CONTAINED IN THIS MANUAL FOR CROWN PRODUCTS. 12/01

9 Warranty



Crown International, 1718 West Mishawaka Road, Elkhart, Indiana 46517-4095 U.S.A. warrants to you, the ORIGINAL PURCHASER and ANY SUBSEQUENT OWNER of each NEW Crown1 product, for a period of three (3) years from the date of purchase by the original purchaser (the "warranty period") that the new Crown product is free of defects in materials and workmanship, and we further warrant the new Crown product regardless of the reason for failure, except as excluded in this Warranty.

1 Note: If your unit bears the name "Amcron," please substitute it for the name "Crown" in this warranty.

This Crown Warranty is in effect only for failure of a new Crown product which occurred within the Warranty Period. It does not cover any product which has been damaged because of any intentional misuse, accident, negligence, or loss which is covered under any of your insurance contracts. This Crown Warranty also does not extend to the new Crown product if the serial number has been defaced, altered, or removed.

We will remedy any defect, regardless of the reason for failure (except as excluded), by repair, replacement, or refund. We may not elect refund unless you agree, or unless we are unable to provide replacement, and repair is not practical or cannot be timely made. If a refund is elected, then you must make the defective or malfunctioning product available to us free and clear of all liens or other encumbrances. The refund will be equal to the actual purchase price, not including interest, insurance, closing costs, and other finance charges less a reasonable depreciation on the product from the date of original purchase. Warranty work can only be performed at our authorized service centers. We will remedy the defect and ship the product from the service center within a reasonable time after receipt of the defective product at our authorized service center.

You must notify your local Crown importer of your need for warranty service within the warranty period. All components must be shipped in the original box. Corrective action will be taken within a reasonable time of the date of receipt of the defective product by our authorized service center. If the repairs made by our authorized service center are not satisfactory, notify our authorized service center immediately.

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YOU ARE NOT ENTITLED TO RECOVER FROM US ANY INCIDENTAL DAMAGES RESULTING FROM ANY DEFECT IN THE NEW CROWN PRODUCT. THIS INCLUDES ANY DAMAGE TO ANOTHER PRODUCT OR PRODUCTS RESULTING FROM SUCH A DEFECT.

No person has the authority to enlarge, amend, or modify this Crown Warranty. This Crown Warranty is not extended by the length of time which you are deprived of the use of the new Crown product. Repairs and replacement parts provided under the terms of this Crown Warranty shall carry only the unexpired portion of this Crown Warranty.

We reserve the right to change the design of any product from time to time without notice and with no obligation to make corresponding changes in products previously manufactured.

No action to enforce this Crown Warranty shall be commenced after expiration of the warranty period.

THIS STATEMENT OF WARRANTY SUPERSEDES ANY OTHERS CONTAINED IN THIS MANUAL FOR CROWN PRODUCTS. 7/01

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Crown Factory Service Information

(Be sure to describe the conditions that existed when the problem occurred and what attempts were made to correct it.)

Other equipment in system: _____

If warranty has expired, payment will be: Cash/Check Visa Master Card C.O.D. Purchase Order for Crown Dealer

Card Number: _____ Exp. Date: _____

Signature: _____

ENCLOSE THIS PORTION WITH THE UNIT. DO NOT MAIL SEPARATELY.



H A Harman International Company